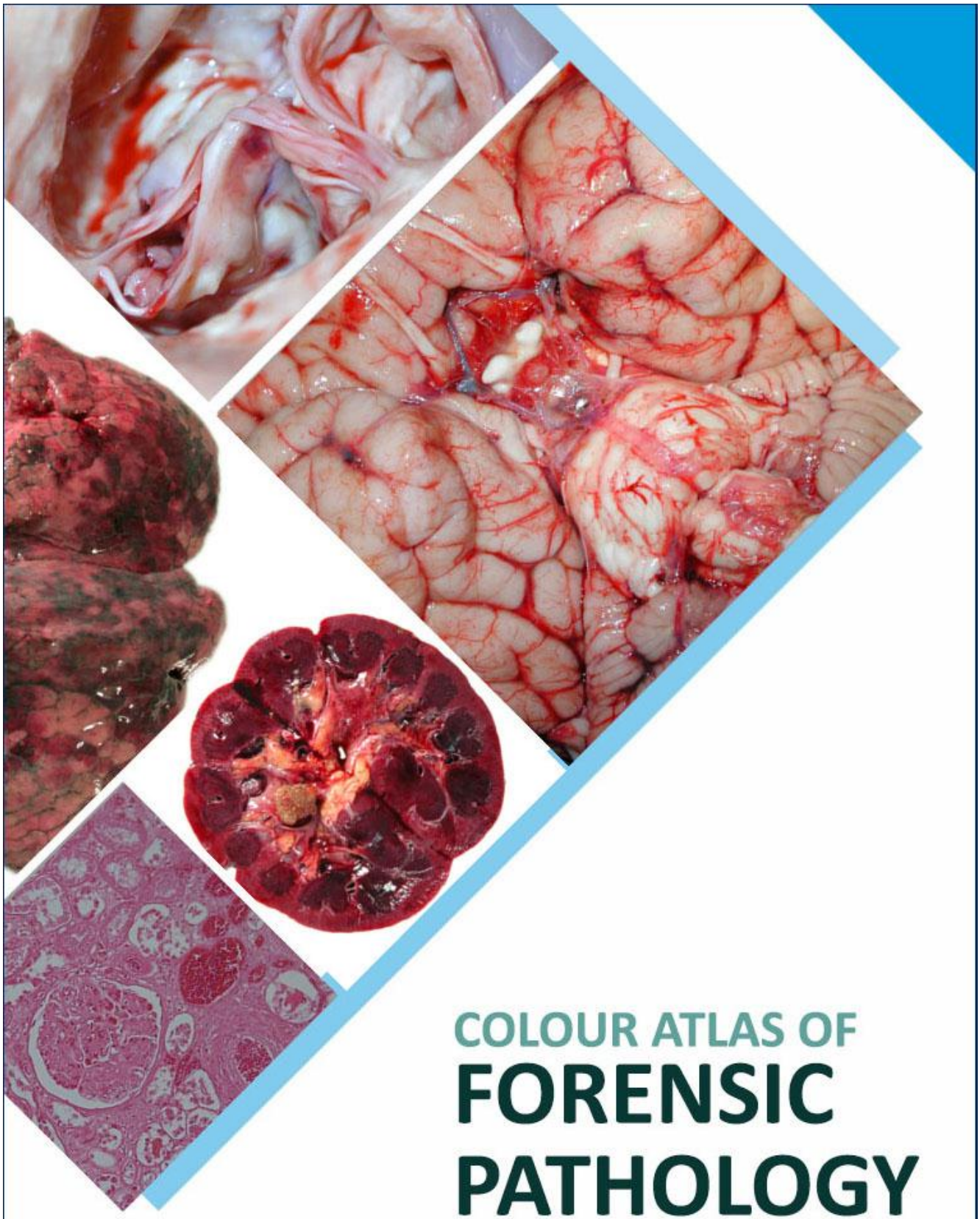

COLOUR ATLAS OF FORENSIC PATHOLOGY

CARDIOVASCULAR DISEASES

COLOR ATLAS OF FORENSIC PATHOLOGY

Version 1

CARDIOVASCULAR DISEASE

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FOREWORD

The greatest pleasure I experience as a teacher, is to see my students excel in their chosen careers and perform even better than myself. The series of e-booklets prepared to better equip medical officers to handle common conditions likely to be encountered in their day to day forensic practice by Professor Dinesh Fernando, is a good example of one of my students doing better than me!

Dinesh is the son of Emeritus Professor of Community Medicine, Former Head, Department of Community Medicine, Former Dean, Faculty of Medicine and Vice Chancellor of the University of Peradeniya, Malcolm Fernando, who was an illustrious medical academic. Following his father's footsteps, he joined the University of Peradeniya in 2003.

Dinesh was one of my post graduate trainees at the Department of Forensic Medicine and Toxicology, Faculty of Medicine, Colombo, and obtained the doctorate in Forensic Medicine in 2003. He underwent post-doctoral training at the Victorian Institute of Forensic Medicine, Melbourne, Australia, with my colleague and contemporary at Guy's Hospital Medical School, University of London, Professor Stephen Cordner. During this period, he served as the honorary forensic pathologist of the Disaster Victim Identification team in Phuket, Thailand following the tsunami, and was awarded an operations medal by the Australian Federal Police.

He has edited, and contributed chapters to, 'Lecture Notes in Forensic Medicine' authored by the former Chief Judicial Medical Officer, Colombo, Dr. L.B.L. de Alwis and contributed to 'Notes on Forensic Medicine and Medical Law' by Dr. Hemamal Jayawardena. He is the editor of the Sri Lanka Journal of Forensic Medicine, Science and Law. Continuing his writing capabilities, he has compiled an important and unique set of e-booklets which will be a great asset to undergraduate and post-graduate students of Forensic Medicine, and also to our colleagues. Its succinct descriptions of complicated medico-legal issues and clear and educational photographs are excellent. It makes it easy for the students to assimilate the theoretical knowledge of each topic as they have been augmented with histories, examination findings, macroscopic and microscopic photographs of actual cases. In some areas, photographs from multiple cases have been included, so that the students can better appreciate the subtle differences that would be encountered in their practice.

I sincerely thank my ever so grateful student Dinesh, for giving me this great honour and privilege to write the foreword.

Professor Ravindra Fernando

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About the authors.....

Dr Dinesh Fernando is a merit Professor in Forensic Medicine at the Faculty of Medicine, University of Peradeniya and honorary Judicial Medical Officer, Teaching Hospital Peradeniya. He obtained his MBBS in 1994 with Second class honours from the North Colombo Medical College, Sri Lanka, and was board certified as a specialist in Forensic Medicine in 2004. He obtained the postgraduate Diploma in Medical Jurisprudence in Pathology from London in 2005, and possesses a certificate of eligibility for specialist registration by the General Medical Council, UK. He underwent post-doctoral training at the Victorian Institute of Forensic Medicine, Melbourne, Australia. He has also worked at the Wellington hospital, New Zealand, as a locum Forensic Pathologist and as an Honorary Clinical Senior Lecturer at the Wellington School of Medicine and Health Sciences, University of Otago, New Zealand. He was invited to visit and share experiences by the Netherlands Forensic Institute in 2019. He was conferred a Fellowship by the College of Forensic Pathologists of Sri Lanka in 2021.

Dr Samadika Wimalarathne is a Temporary Lecturer at the Department of Forensic Medicine, Faculty of Medicine, University of Peradeniya. She obtained her MBBS in 2022 with Second class honours from the Faculty of Medicine, University of Peradeniya. She has 10 distinctions, including a distinction in Forensic Medicine.

PREFACE

Forensic Medicine in Sri Lanka encompasses, both, examination of patients for medico-legal purposes and conducting autopsies in all unnatural deaths, in addition to those that the cause of death is not known. In the eyes of the justice system in Sri Lanka, all MBBS qualified medical officers are deemed to be competent to conduct, report and give evidence on medico-legal examinations of patients and autopsies conducted by them, as an expert witness. However, during their undergraduate training, they may not get the opportunity to assist, nor observe, a sufficient variety of representative of cases that may be encountered in the future.

Therefore, a series of e-booklets has been prepared to better equip medical officers to handle common conditions that are likely to be encountered in day to day forensic practice. The case histories, macro and micro images are from cases conducted by Prof. Dinesh Fernando. The compilation of the case and photographs for publication was done by Dr. Samadika Wimalarathne. Ms. Chaya Wickramarathne did a yeomen service in design, lay out and formatting the booklet.

The content herein may be used for academic purposes with due credit given. Any clarifications, suggestions, comments or corrections are welcome.

COLOUR ATLAS OF

FORENSIC PATHOLOGY

v

ILLUSTRATIVE CASES

Pulmonary Artery Dissection

Pulmonary Artery Dissection

Pulmonary artery dissection (PAD) is a rare, and usually lethal, complication of chronic pulmonary arterial hypertension (PHT). PHT is usually caused by heart disease, both congenital (mainly PDA) and acquired. Although chronic obstructive pulmonary disease is a known cause of pulmonary hypertension, pulmonary artery dissection has been rarely reported in this group of patients.

PAD commonly occurs at the site of a pulmonary artery aneurysm. Due to prolonged PHT, endothelial damage, atheroma formation, mucoid degeneration of the media and fragmentation of the elastic fibres occur, causing a weakening of the pulmonary arterial wall, predisposing to dissection. Dissection of the pulmonary artery occurs through a tear of the intima into the mid or deep media. Thereafter, the dissection tends to propagate along intramedial planes. Longitudinal dissection occurs due to the blood pressure developed within the media leading to a false lumen. Due to the low resistance to blood flow inside the lungs, the pulmonary arterial media is thinner than the aorta. PAD progresses rapidly, and results in a rupture, rather than re-entry, as occurs in aortic dissection. Rupture may occur into the pericardium, mediastinum, lungs, or pleural cavity. The commonest site of pulmonary artery dissection is the main pulmonary artery / pulmonary trunk and rarely involves the branches of the pulmonary artery.

Pulmonary artery dissection classically presents in the fifth and sixth decades with dyspnoea associated with chest pain, cardiogenic shock or sudden death. Hence, it is typically diagnosed at post-mortem examination.

However, with a high degree of suspicion and immediate chest radiography, trans-thoracic echocardiography followed by CT scan, an ante mortem diagnosis may be made. Immediate surgery, or conservative management followed by surgery is the best treatment option. Early detection by screening and treatment of heart disease and prevention of the development of PHT is of paramount importance.

History

A patient with atrial septal defect (ASD) and pulmonary arterial hypertension who complained of cough, dyspnoea and recurrent haemoptysis was admitted to hospital. Two days later he developed severe haemoptysis and passed away.

Internal Examination

A large fenestrated ASD and an 8 cm diameter aneurysm of the right pulmonary artery with a dissection extending to the lung were detected during the autopsy. Pulmonary artery dissection was confirmed by histology.

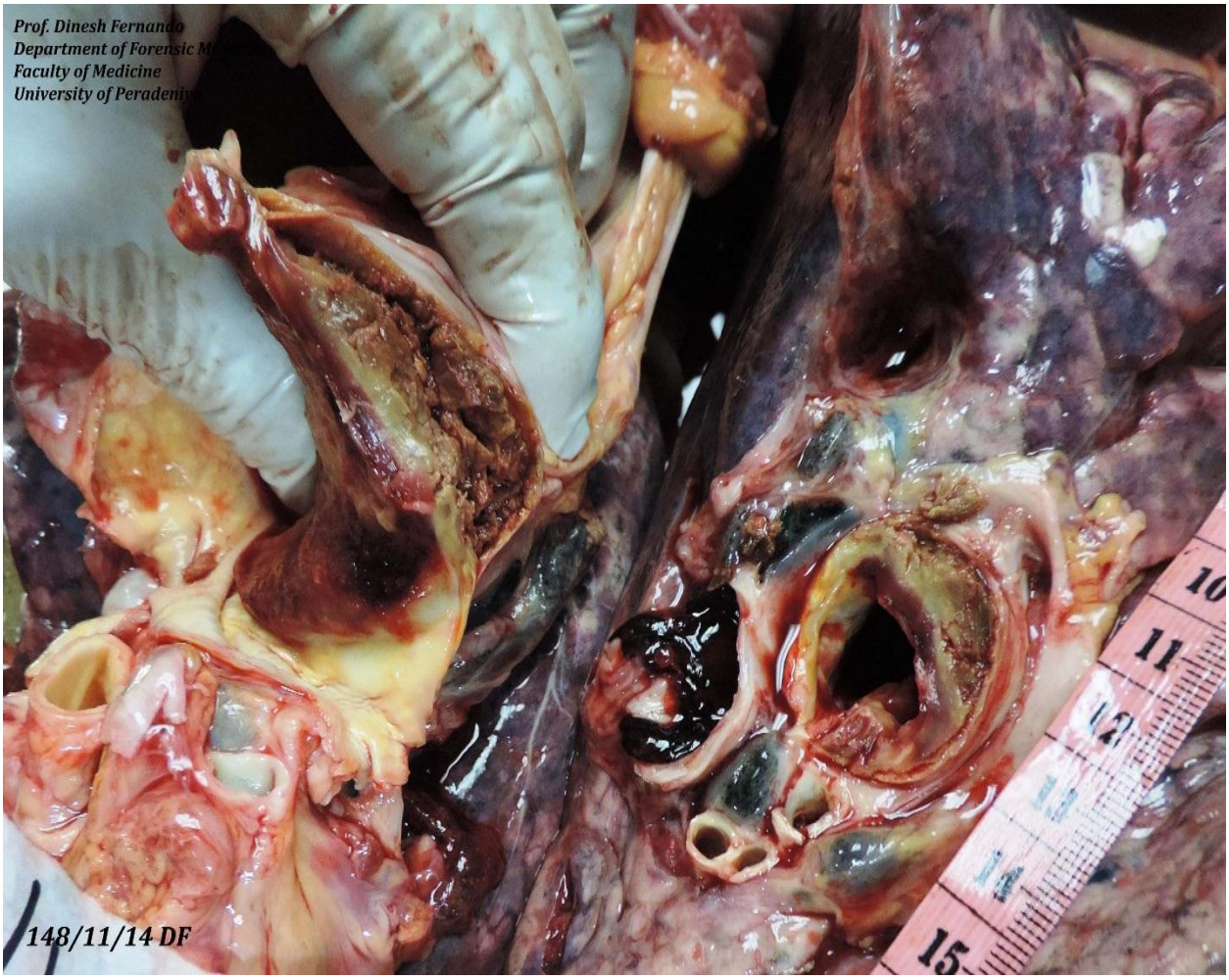

Figure 1: Dissection of pulmonary artery with haemorrhages in the lung.

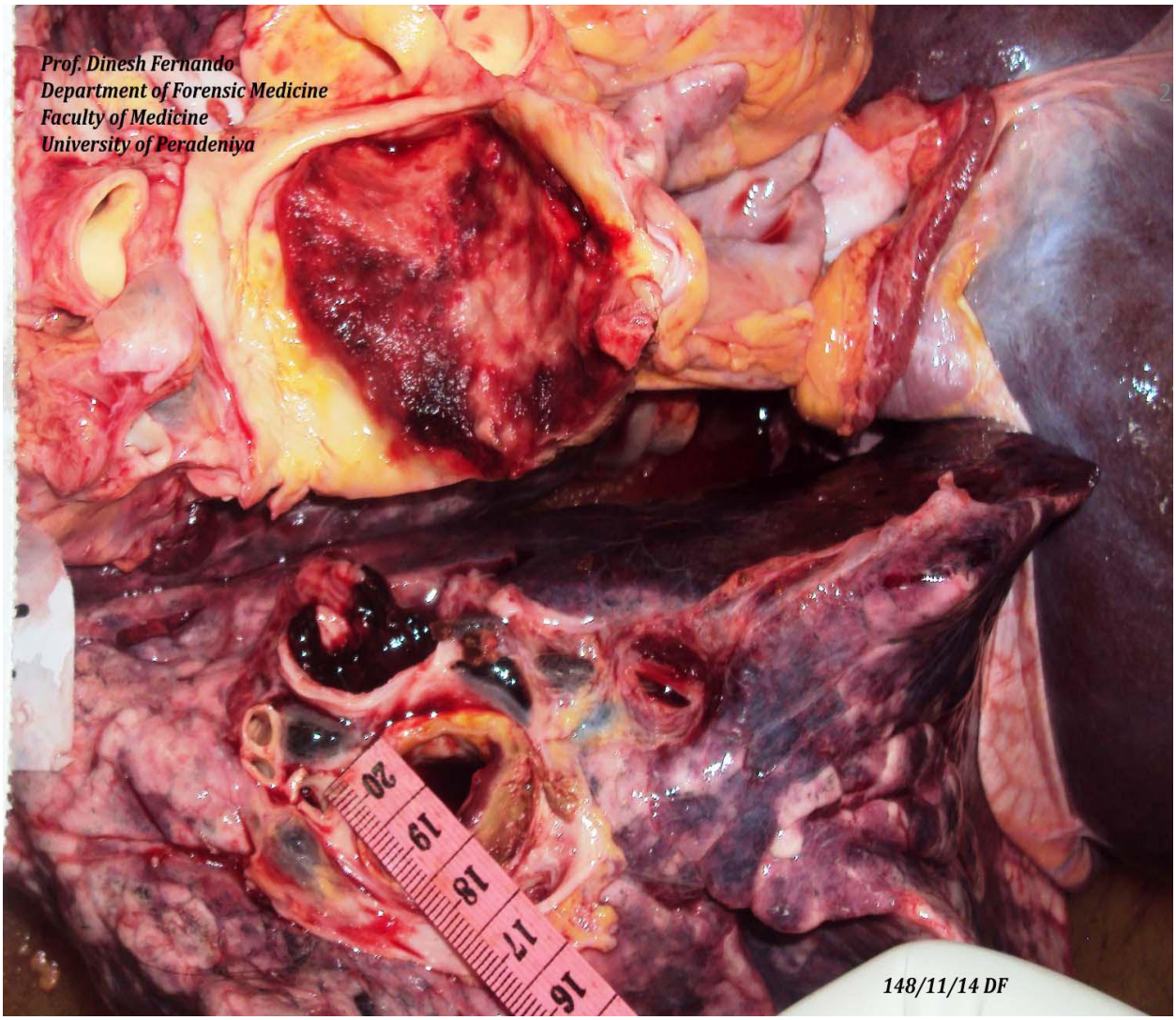

Figure 2: Dissection of pulmonary artery with lung haemorrhages.

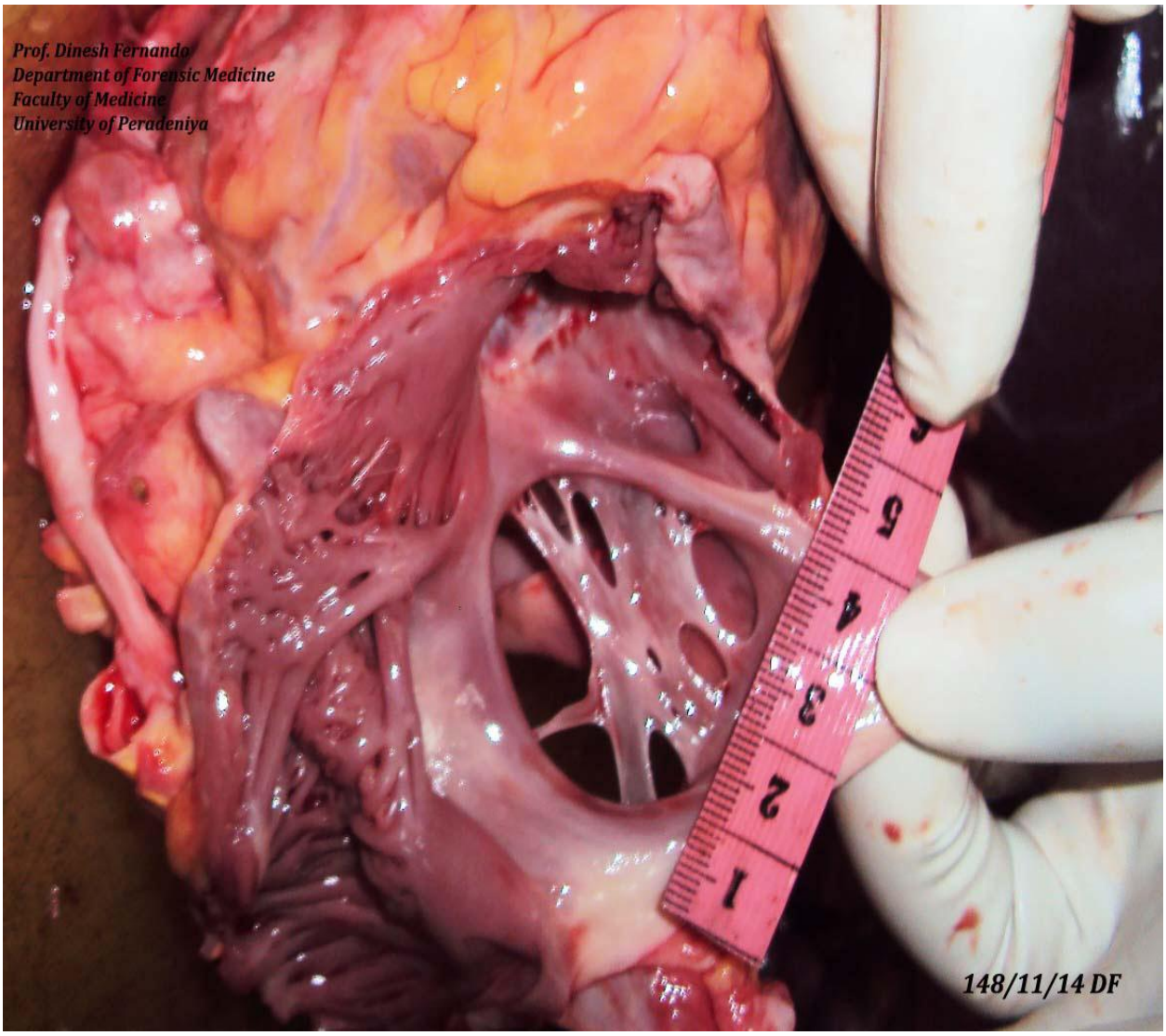

Figure 3: Fenestrated atrial septal defect.

Microscopic examination

Histological examination confirmed pulmonary artery dissection and atherosclerotic plaques and thrombi were seen within the vessel.

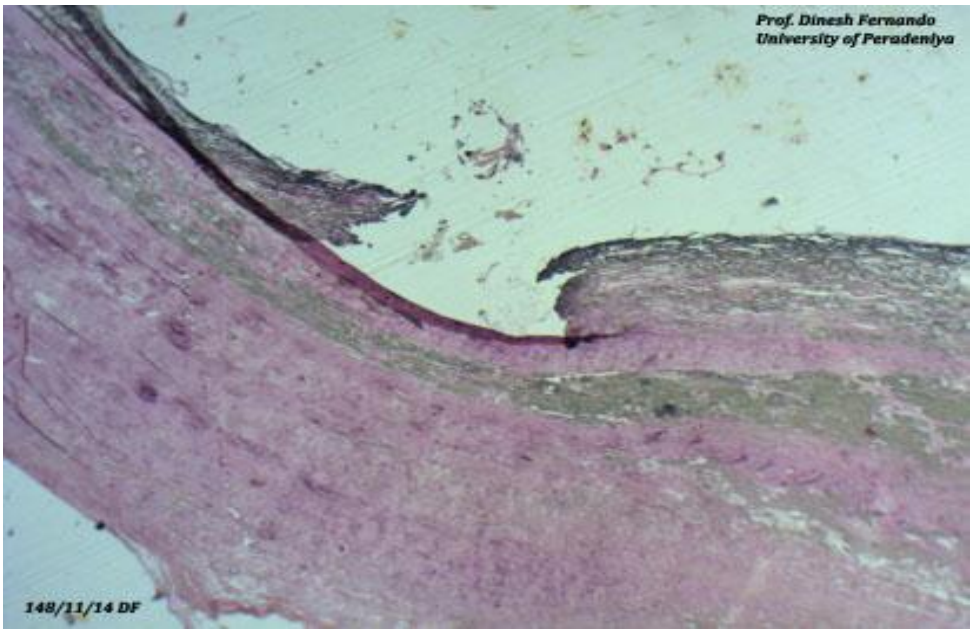

Figure 4: Stained with Elastic Van Gieson's stain. Blood is in green colour and the vessels are in pink.

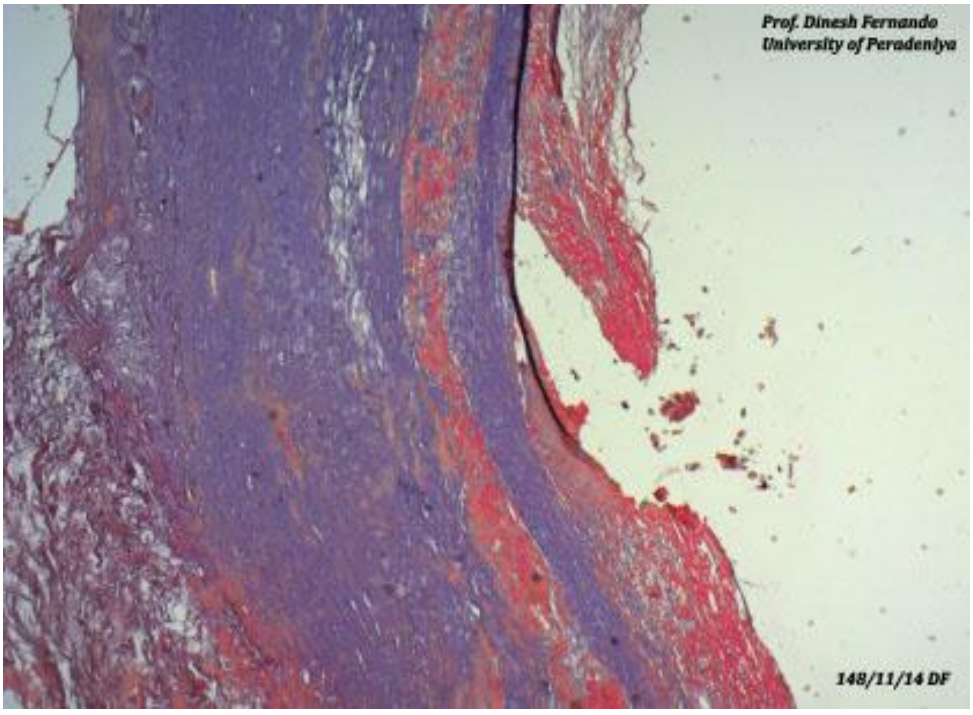

Figure 5: Stained with Mason Trichrome stain. Blood is in red and the vessels are in purple.

Cause of death

Pulmonary artery dissection resulting in pulmonary haemorrhage causing respiratory insufficiency.

Bibliography

1. Khattar RS. Fox DJ, Alty JE, Arora A. Pulmonary artery dissection: an emerging cardiovascular complication in surviving patients with chronic pulmonary hypertension. Heart. 2005;91(2):142–5. https://pubmed.ncbi.nlm.nih.gov/15657218/ doi: 10.1136/hrt.2004.045799.

2. Zhang C, Huang X, Li S, Yao H, Zhang B. Pulmonary Artery Dissection: A Fatal Complication of Pulmonary Hypertension. Case Reports in Medicine [Internet]. 2016:4739803. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5126397/ doi: 10.1155/2016/4739803.

3. Fernando DMG, Thilakarathne SMNK, Wickramasinghe CU. Pulmonary artery dissection-A review of 150 cases. Heart & Lung: The Journal of Critical Care [Internet]. 2019;48(5):428–35. Available from: https://pubmed.ncbi.nlm.nih.gov/30910250/ doi: 10.1016/j.hrtlng.2019.02.007.